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thus 1,628 ( $H_2O$ ) ; and the weight of its volume at the temperature of formation, as compared with an equal volume of hydrogen gas or of steam, in other words, its equivalent weight, is  $1,628 \times 18 = 30,304$ , which thus corresponds to a specific gravity of 1.0000 : ice, at its temperature of formation, with a specific gravity of 0.9167, being  $1,487 (H_2O)$  with an equivalent weight of 26,766. The hydrocarbon,  $C_4H_{10} = 58$ , condenses to a liquid having, according to Pelouze and Cahours, a specific gravity of 0.600, which corresponds to an equivalent weight, as compared with that of water, of 17,582, or approximately 303 ( $C_4H_{10}$ ), with a calculated specific gravity of 0.5997. The reciprocal of the coefficient of condensation (or so-called molecular volume) of steam is 18, while that of the gaseous hydrocarbon is  $600 : 1000 :: 58 : x = 96.66$ .

The chemical unit for bodies, which, like these, volatilize integrally, is fixed by the density of their vapors; while for fixed species, like anhydrous oxides and silicates, or for those which by heat undergo heterogeneous dissociation, as for example calcite and hydrous silicates, the unit may be the simplest formula deduced from analysis, or, for greater convenience in calculation in the case of oxides and silicates, may have a value corresponding to  $H = 1$ , or  $O = 8$ . The unit for silica thus becomes  $SiO_2 \div 4 = 15$ ; that for alumina,  $Al_2O_3 \div 6 = 17$ ; and that for the magnesian silicate,  $SiMg_2O_4 \div 8 = 17.5$ . Such unit-weights as these have been employed by the writer in his late essay on 'A natural system in mineralogy,' in the tables of which they are represented by P; while the values got by dividing these numbers by the specific gravity of the species have been designated unit-volumes, and represented by V. The writer of that essay, in deference to the general usage of chemists, therein adopted the received terminology of 'molecular weights' and 'molecular volumes,' and, failing at the time to grasp the full significance of his own earlier teachings as to the universality of the law of volumes, spoke of the so-called molecular weight as an unknown quantity, although in accordance with that principle this molecular weight, or, properly speaking, this equivalent weight, is simply deduced for any body the specific gravity of which is known.

T. STERRY HUNT.

Centre Harbor, N.H., Sept. 3.

#### The old gorge at Niagara.

The existence of a drift filled channel running from the west side of the whirlpool on the Niagara River, to the wide, open valley of St. David's on the north face of the Silurian escarpment, has been known to geologists ever since the publication of Sir C. Lyell's 'Principles of geology.' It was considered by him as an ancient channel of the river, and it has been so regarded by many geologists ever since. Arguments numerous and of no slight weight can be quoted in favor of this opinion. But of late years it has been somewhat modified, and a disposition has been manifested to regard this drift-filled valley of St. David's as consisting of two smaller valleys, one of which was excavated by a stream flowing into the place of the present whirlpool, and the other into the valley of St. David's. On the latter theory there may be a solid barrier of rock not far underground between the two valleys. In the latter no such bar can exist.

Into the discussion of this subject I will not now enter. It would require more time and space than

can be afforded. I desire merely to mention a single fact. In the course of the arguments on this point it has been apparently taken for granted, if not asserted, that no rock can be seen in place along this gorge, but that it is filled deeply with drift almost from end to end. During the recent meeting of the American association I took an opportunity of going up the valley from the whirlpool, and was much surprised to find a ledge of limestone exposed at its bottom about a hundred feet above the river. On both sides it disappeared beneath the talus, but probability indicates its continuance from side to side, especially as a considerable surface is exposed. This point can only be decided by quarrying.

The importance of a bed of limestone so situated, on the discussion of this question, is obvious. It does not seriously affect the latter of the two hypotheses mentioned above, which is, however, beset by other grave difficulties. But in regard to the former it proves, that, if the Niagara River ever passed that way, its bed was far above the present level. No concealed side-channel can be admitted in this case. The space is too small. A line of drill-holes carried along the course of the valley can alone supply the evidence needed for a decision between the two rival theories.

It is scarcely necessary to point out the bearing of this fact on those calculations of the age of the great gorge which assumes that any part of it above the lower rapids was merely cleaned out and not excavated from solid rock since the end of the ice age.

E. W. CLAYPOLE.

#### Science for a livelihood.

Some time ago I read in your journal a stirring editorial, calling for young men to devote their energies and life to the cause of science, and deplored the lack of persons who were willing to encounter hard work and poor pay because of love for investigation and study.

Early this summer, after graduating from a first-class scientific school, I made application to four agricultural stations in this and other states for some position, pay no consideration whatever. Having been brought up on a farm, and having a first-rate scientific education, a love of the natural sciences (in which I have done a little practical work), and an excellent physique, I thought myself fitted for investigation in scientific fields, particularly as I love it above all else.

In every case I received answer, 'Places all full.' I have begun to doubt if investigators and workers are needed in the natural or experimental sciences, and think that a poor young man who cannot afford to give money to the work has no call in this field. Am I right?

C. B.

Brooklyn, N.Y., Sept. 4.

#### Revivification.

In answer to your Paris correspondent, I would say that quite recently, a native of India, after his conversion to Christianity, gave an exhibition and full explanation of the trance, as I am informed by a missionary just returned from that country. Full particulars can be obtained by addressing Rev. S. Knowles, Gonda, Province of Oude, India.

E. T. NELSON.

Ohio Wesleyan University, Sept. 6.